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3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER CHU, HELEN OK	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 01/17/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LegalUSDocketing@mmm.com  
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## Office Action Summary

Application No.

10/502,443

Applicant(s)

NG ET AL.

Examiner

Helen O. Chu

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 32-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) 52 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Applicant's Amendments have been received on November 20, 2007. Claim 1 and 52 has been amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

### ***Election/Restrictions***

3. Claim 52 ~~was~~ stand withdrawn from consideration for the same reasons expressed in the Lack-of-Unity set forth in the Office Action dated 5/16/2006 (i.e. at least independent claim is obvious in view of prior art).

### ***Claim Objections***

4. Claim 52 objected to because of the following informalities: Claim 52 should have the proper identifier (Withdrawn-Currently Amended). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed,

had possession of the claimed invention. The "active area" as disclosed by the Applicants' specification on Page 19, lines 5-25 appears to be part of the cooling bladder and not part of each electrochemical cell. Line 4 states," According to the illustration, the cooling bladder 30 includes an active region 37 and a sealed region 39," line 7 states," the active region 37 thus represents thus represents the portion of the cooling bladder," line 17 states," the active region 37 of the cooling bladder."

Appropriate corrections.

7. Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for cooling bladder, each having an active area, does not reasonably provide enablement for "electrochemical cells, each having an active area." The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make/use the invention commensurate in scope with these claims. . The "active area" as disclosed by the Applicants' specification on Page 19, lines 5-25 appears to be part of the cooling bladder and not part of each electrochemical cell. Line 4 states," According to the illustration, the cooling bladder 30 includes an active region 37 and a sealed region 39," line 7 states," the active region 37 thus represents thus represents the portion of the cooling bladder," line 17 states," the active region 37 of the cooling bladder."

Appropriate corrections.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "a plurality of electrochemical cells, each having an active area" is unclear to the Examiner. Though it is inherent that the electrochemical cells have an active area (electrodes), the active area as disclosed by the Applicants' specification on Page 19, lines 5-25 appears to be part of the cooling bladder and not part of the electrochemical cell as it is claimed in claim 1. Line 4 states, "According to the illustration, the cooling bladder 30 includes an active region 37 and a sealed region 39," line 7 states, "the active region 37 thus represents thus represents the portion of the cooling bladder," line 17 states, "the active region 37 of the cooling bladder." Appropriate corrections.

10. Claims 1-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether the cooling bladder contacts the external surface or internal surface of the cell. Note that the limitation "external to the electrochemical cell" has been deleted. Thus, the specific structural arrangement of the bladder with respect to each cell is uncertain. Appropriate corrections.

11. Claims depending from claims rejected under 35 U.S.C. 112, first and second paragraph are also rejected for the same.

### ***Claims Analysis***

12. For purposes of compact prosecution, the Examiner will interpret active surface to be the electrodes of the electrochemical cell. Though the reference of Page 19, Lines

5-25 are for "active regions" of the cooling bladder. It is unclear whether "active areas" are equivalent to "active regions" as stated by the disclosure or whether the "active areas" refers to the active areas of electrochemical cell (electrodes) as it is claimed in claim 1.

***Claim Rejections - 35 USC § 103***

13. The rejections under 35 U.S.C 103 (a), on claims 1-15, 17, 20-24, 27-31, as unpatentable by Verhoog in view of Brinkman et al. are maintained

14. The rejection under 35 U.S.C 103 (a), on claim 16, as unpatentable by Verhoog in view of Brinkman et al. in further view of Fitts et al. is maintained

15. The rejections under 35 U.S.C 103 (a), on claims 25 and 26, as being unpatentable over in view of Brinkman et al. in further view of Gyoten et al. are maintained.

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 1-15, 17-24, 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315).

In regards to claim 1 and 14, Verhoog teaches each of the electrochemical cells comprising opposing first and second planar surfaces (Figure 4) and being subject to

volumetric changes during charge cycling (Column 1, Lines 24-25) with a unitary cooling tank (Figure 4) which is external to the electrochemical cells, formed of a polypropylene (Column 4, Line 40) plastic material (Column 2, Line 46) and having an inlet fluid orifice and an outlet fluid orifice (Column 2, Lines 34-36), the cooling bladder having a substantially flat shape (Figure 4) and circulates liquid between the inlet and outlet (Column 1, Lines 55-60).

In addition, the Verhoog reference discloses it is known to one of ordinary skill in the art that for the electrode assemblies to be uniformly cooled, a system of above kind is preferably placed on the walls of the tank facing the edges of the electrodes (Applicants contact between the adjacent cells active area and cooling bladder) Column 1, Lines 44-47). Please also refer to Figures 1 and 2, in which the cells are taken along line H-H and the position of the tank is parallel to line H-H. The line perpendicular to line H-H or the tank has electrodes of each cell touching the wall of the tank.

However, the Verhoog reference does not disclose a deformable bladder. The Brinkman et al. discloses a cooling bladder made of plastic preferably polyethylene because of its relatively good heat conductivity accompanied by high specific conductivity (Column 4, Lines 15-18). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to incorporate a deformable (because it is a bladder) polyethylene plastic, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claims 2-7, 10 and 23, the Verhoog et al. teaches a cooling tank, which covers all the surface area of the electrochemical cells with continuous and hollow interior flanges (Applicant's flow channels), which the medium passes (Figure 3 and 4). The cooling tank comprises serpentine ribs (Applicant's support arrangement and thickened sections; Column 5, Line13; Component 41) located on the outer surface and at bends of the tank that inhibits restriction of cooling medium (Figure 4).

In regards to claims 8 and 9, the Verhoog et al. teaches an electrolyte that fills the cells and disposed at all areas of the cell (Column 4, lines 47-49).

In regards to claims 11-13, The Verhoog et al. reference teaches a plurality flanges that causes the fluid flowing in the compartment to flow alternatively in the opposite direction (Column 3, Lines35-37).

In regards to claim 15, the Verhoog et al. reference teaches a tank made of a plastic material and each flange of the tank is stacked one on top of each other. Together, all the polypropylene material forms a plurality of material layer.

In regards to claim 17, the Verhoog et al. reference teaches the polypropylene tank which consist of ribs have the height of 3mm to 4mm (Column 5, Lines 15-16).

In regards to claim 20-22 and 27, the Verhoog et al. reference teaches an electrochemical assembly uniformly cooled (Column 1, Lines 44), hence, there will not be any temperature difference and the heat transfer medium entering the electrochemical cell has to be constant.

In regards to claim 24 and 28-31, the Verhoog et al. reference teaches a nickel metal hydride (Column 1, Line 21); it is inherent for a nickel metal hydride to operate



between 20°C to 130°C. The Verhoog et al. reference illustrates four edges of which the cooling tank contacts (Figure 1) and a housing incorporates two orifices for each cell respectively receiving a terminal of each polarity (Column 4, Lines 45-47) and a manifold that has an inlet and outlet manifold (Figure 1).

In regards to claim 18, the Verhoog and Brinkman et al. reference discloses the claimed invention except for a plurality of cooling tanks. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of cooling tanks, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. (MPEP 2144.04 VI).

In regards to claim 19, the Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein. It would have been obvious if the electrochemical cell ran for a long period of time, the heat transfer medium would be consumed and would eventually be less than 50% by volume or weight.

18. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Fitts et al. (US 2002/015333).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a thermally conductive material comprises a metallic layer disposed between a first polymer layer and a second polymer layer. The Fitts et al.

reference teaches a core material that is made of metallic, non-metallic or metallic with non-metallic materials that have a high thermal conductivity. Therefore, it would be obvious to one skilled in the art at the time the invention was made to incorporate a layer of metallic, non-metallic or metallic with non-metallic material into the heat transfer system as taught by Verhoog and Brinkman et al. to insure the system is transferring heat efficiently.

19. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Gyoten et al. (US 2001/0036567).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a coolant to be water or aqueous ethylene glycol. The Gyoten et al. reference teaches water or aqueous ethylene glycol to be a coolant in order to prevent destruction of the cell by varying temperatures (Paragraph 47).

### ***Response to Arguments***

1. Applicant's arguments filed November 27, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

a. However, the Examiner admits that the Verhoog reference does not disclose a deformable bladder. The Examiner has characterized Brinkman et al. as disclosing a cooling bladder made of plastic preferably polyethylene because of its

relatively good heat conductivity accompanied by high specific conductivity. According to the Examiner, it would have been obvious to one of ordinary skill at the time the invention was made to incorporate a deformable (because it is a bladder) polyethylene plastic.

b. The Examiner has not shown that Verhoog teaches or suggests a deformable bladder with a limitation that there is contact between the surfaces of each of the cells adjacent the cells' active areas during volumetric changes. The tank of Verhoog is fixed in dimension by the walls of the cell formed by flanges and the tank only contacts the wall of the cell (not an electrochemical cell) that contains the electrolyte and not the area adjacent to the electrochemical cells' active areas. As seen by Figure 1 of the instant specification, the Applicants'-cooling bladder 30 is in direct contact with the each of the electrochemical cells 15 (cells' active area) and the cell' stack 28. Thus, the Examiner has not shown that Verhoog discloses all of the limitations of Applicant's amended claim 1.

In response to Applicant's arguments, please consider the following.

a. To clarify, the Verhoog reference discloses a polypropylene tank (Column 4, Lines 40-42) or a plastic tank (Column 2, Lines 45-47) which is equivalent to the Applicants cooling bladder, it is also known to one of ordinary skill in the art that plastic tanks are deformable. Though it is known to one of ordinary skill in the art that plastics are deformable, for further clarification, the Brinkman et al. reference was included to clarify that plastics tanks are deformable. It bears noting that limitations "deformable" and "conformable" in the present claims, as instantly recited, simply require that

Applicant's bladder be capable of deforming and conforming when subject to compressive stress or pressures acting in the electrochemical storage system. Since both the conforming and deformation degree of the bladder as well as the magnitude of the compressive stress or pressures are unclaimed and unknown, it is noted that the propylene/plastic tank of Verhoog meets the claimed requirement of being deformable and conformable as propylene/plastic materials possess certain degree of elasticity and resiliency, thereby giving them the capability of easily conforming and deforming to desirable shapes, sizes or contours regardless of the specific elasticity/resiliency degree. In this regard, it is pointed out that the above-mentioned limitations are relative term, and neither the present claims nor the specification provides the standard for ascertaining the requisite degree of the bladder's deformability and conformability.

b. The Verhoog reference discloses that it is known to one of ordinary skill in the art to place the walls of the tank facing the electrodes. The assertion of the Applicants are incorrect, again, the walls of the tank facing the edges of the electrodes (Applicants contact between the adjacent cells active area and cooling bladder) Column 1, Lines 44-47). Please also refer to Figures 1 and 2, in which the cells are taken along line H-H and the flatter position of the tank is parallel to line H-H. The line perpendicular to line H-H or the tank is parallel to the electrodes of each cell, hence the tank is perpendicular to each cell and are touching each individual cell.

### ***Conclusion***

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4: 30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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HOC



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PRIMARY EXAMINER